

## CLAIMS

1. A wafer polisher having thickness measurement capabilities, the polisher comprising:
- a polishing unit for polishing a top layer of a wafer in the presence of a slurry;
  - a thickness measuring unit mounted on said polisher for measuring the thickness of said top layer while said wafer is immersed in said water.
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2. A polisher according to claim 1 and wherein said polisher comprises an output track with said water flowing therein, said output track comprises a bottom surface having a window mounted therein.
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3. A polisher according to claim 2 and wherein said thickness measuring unit comprises:
- a curved gate having a radius of curvature generally similar to that of said wafer, said curved gate being located at a gripping position;
  - a gripper for moving said wafer from said gripping position to a measuring position above a layer of water located above said window; and
  - an optical system, mounted underneath said window, for measuring said thickness of said top layer through said window and said layer of water.
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- 20 4. A polisher according to claim 1 and also comprising a pull-down unit for pulling at least said bottom surface below the horizontal.
5. A thickness measuring unit for mounting on a water track of a polisher for measuring the thickness of a top layer of a wafer, said thickness measuring unit comprising:
- a curved gate having a radius of curvature generally similar to that of said wafer, said curved gate being located at a gripping position;
  - a window mounted in a bottom surface of said water track;
  - a gripper for moving said wafer from said gripping position to a measuring position above a layer of water located above said window; and
  - an optical system, mounted underneath said window, for measuring said thickness of said top layer through said window and said layer of water.
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6. A unit according to claim 5 and wherein said gripper comprises a gripping pad mounted to said gripper, wherein an axis of symmetry of said gripping pad is at an angle to the horizontal.

5 7. A unit according to claim 6 and wherein said gripping pad comprises a bellows shaped pad and operates in conjunction with a vacuum pump for creating a suction within said pad.

10 8. A polisher according to claim 1 and wherein said thickness measuring unit comprises:  
a. a water bath having a window in a bottom surface thereof;  
b. a gripper for moving said wafer from a gripping position above said water bath to a measuring position above a layer of water located above said window; and  
c. an optical system, mounted underneath said window, for measuring said thickness of said top layer through said window and said layer of water.

15 9. A thickness measuring unit for mounting on a water bath for measuring the thickness of a top layer of a wafer, said thickness measuring unit comprising:  
a. a water bath;  
b. a window mounted in a bottom surface of said water bath;  
20 c. a gripper for moving said wafer from a gripping position above said water bath to a measuring position above a layer of water located above said window; and  
d. an optical system, mounted underneath said window, for measuring said thickness of said top layer through said window and said layer of water.

25 10. A unit according to claim 9 wherein said gripper comprises a gripping pad mounted to said gripper, and wherein an axis of symmetry of said gripping pad is at an angle to the horizontal.

30 11. A method of placing a wafer in a water without introducing generally any bubbles underneath said wafer, the method comprising the step of immersing said wafer within said water such that the plane of said wafer is at an angle to the surface of said water.

12. A method according to claim 11 and comprising the step of pressing said wafer against a surface which is parallel to a measurement window underneath the surface of said water.

5 13. A method of measuring the thickness of a polished top layer of a wafer before removing said wafer from a polishing machine, said method comprising the steps of:

- Sub A3*
- a. picking said wafer up from a gripping position;
  - b. moving said wafer from said gripping position to a measuring position;
  - c. placing said wafer in said measuring position underneath a surface of said water but a thin layer of said water located above a window; and
  - d. measuring said thickness of said top layer through said window and said layer of water.

10 14. A method according to claim 13 and wherein said step of placing comprises the step of immersing said wafer within said water such that the plane of said wafer is at an angle to the surface of said water.

15 15. A method according to claim 13 wherein said water is held within a water bath and wherein said step of moving comprises the step of changing the angle of the lower surface of said water bath to move said water towards said measuring position.

*Sub A4*  
20 16. A method according to claim 14 wherein said water is held within a water bath and wherein said step of moving comprises the step of changing the angle of the lower surface of said water bath to move said water towards said measuring position.